

U.S. Application No.: 09/868,297  
AMENDMENT B

Attorney Docket: 3968.031

24. A process as in claim 21, wherein said granules are formed by agglomeration.--

REMARKS

Review and reconsideration of the Office Action dated December 23, 2002, is respectfully requested in view of the above amendments and the following remarks.

Applicants appreciate that entry and consideration of new claims after a final rejection is discretionary with the Examiner. However, Applicants

- (a) cancel four independent claims - claims 18-20 - and
- (b) respectfully submit that the new claims, focusing on the inventive reduced "residency time" of the flavoring and/or perfume preparation in the fluidized bed and thereby increase retention of volatile flavoring and/or perfume ingredients, i.e., maintain substantially the same proportions in the granules as in the spray solution more succinctly define the invention and are responsive to the issues raised by the Examiner during prosecution.

Briefly reviewing, the present inventor recognized that there was a recurring problem associated with the state of the art fluidized bed processes for encapsulating flavoring or perfume compositions, namely, during this process not only is **solvent** removed by the fluidizing gas, but also about 10-15% of the **volatile flavor or fragrance components** are removed and

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lost. Thus, while known process produce encapsulated flavor or perfume particles with good spherical shape and good particle size distribution, they suffer from a problem: if a desired final flavor or perfume formulation is sprayed into the fluidizing gas, VOC (not only solvent, but also volatile flavor or perfume ingredient) is lost during the spray agglomeration process, and the flavor or fragrance of the final particle product is different from the starting formulation.

The references cited by the Examiner merely exemplify the state of the art. Applicants have closely read Johnson (USP 4,567,737), the main reference relied upon by the Examiner. According to the teachings of Johnson, an emulsion of volatile liquid and suitable carrier material and water is sprayed into a fluidized bed agglomerator, which has previously been charged with a small quantity of a particulate carrier material or, preferably, with a sample of small encapsulates containing the volatile liquid to be employed in the bulk preparation. Thus, granulation nuclei are not formed in the fluidized bed, as required in present claim 1.

It is noted that at (col. 3, line 15) there is disclosure that it is desirable to run the process as a **continuous** one to ensure maximum uniformity of product. However, Johnson also teaches that the residence time is variable, that spraying of emulsion may be continued until desired particle size has been reached, **There is no teaching of sifting out "mature" particles and introducing new nuclei.** So what would the person of

ordinary skill in the art understand to be meant here by "continuous"? Evidently, small batches are to be continuously made consecutively. This "continuously repeated batch process" is not the same as the continuous process recited in claim 21.

In Example 1 (and thus also Examples 3-5) 400g Capsul, 600g water and 250g perfume (=1250g) are pumped into the fluidized bed at a flow rate of between 10/20 g min., then fluidization was continued for 2-3 minutes, and finally **all the product was discharged from the agglomeration chamber**. The procedure thus took anywhere from 65 -125 minutes (depending upon flow rate). Since the material was continuously sprayed in, the mean **residence time** (total/2) would be **32-62 minutes**. **Thus, closest prior art would be 32 minute mean residence time.**

Johnson Example 2, the alternative example, begins with 10Kg emulsion, adds at 2.5 to 5 Kg/hr, so estimate 2-3 hrs, mean time = 1-1.5 hrs. In view of large mass and long time, Example 2 is not as close as Example 1.

Accordingly, Johnson is not relevant in that

- the Examples are limited to a **batch process** (the specification teaches that all "product is discharged"),
- the products produced in the batch process, when compared to the original formulation, are "**acceptably similar**" or "**compared satisfactorily**" - the person of ordinary skill in this art, reading this, having experience with this technique, would understand that

some components of the original fragrance or flavor components were lost, otherwise the evaluation would have read "identical to original",

- there is merely mention that "Since the residence time in the fluidized bed is controllable, the spraying of the emulsion may be continued until the required particle size of encapsulate has been obtained".

"Furthermore, since the **residence time is not critical**, the equipment used for spraying in the emulsion onto the bed may be chosen to cover a wider range of viscosity and flow characteristics than is normally available in a spray-drying tower." (col. 3, line 21) This teaches that (a) residence time does not influence final product, and (b) that the same results can be obtained at any desired residence time.

Accordingly, this reference teaching that residency time in a batch process is not critical, and that the disclosed "best mode" of the process is capable of producing only "acceptable" product, is not relevant to the present product by process claims by which a superior product is obtained without waste.

Applicants further advise that the way known in the art to address this "lost VOC" problem is to "front end load" the sprayed in formulation with a disproportionately high amount of the volatile component, based on a prediction of the amount that will be lost. However, since this VOC component may be expensive and is lost, this increases the cost of the process.

Further, VOC are considered pollutants and have to be captured, adding equipment cost. Further, it is difficult to predict precisely how much supplemental volatile chemical must be added up front in order to arrive at the desired final balanced formulation since -

- (1) the vapor pressure of some VOC's may change the evaporation rate of other VOCs, affecting the final balance,
- (2) the evaporation or entrainment rates vary with process parameters such as temperature, gas, etc, thus for each set of process parameters a different starting mixture must be formulated, and the process parameters must be strictly controlled to avoid off-flavor final product, and
- (3) a perfume or flavor has many ingredients, and it is the final balance that determines fragrance or taste, thus a slight change in balance can render a final granules off-target and useless.

Accordingly, the known way to attempt to counteract the loss of VOC is wasteful and complex and does not reliably produce good product.

Applicants recognized that what is needed is a way to produce a final product which has flavor or perfume characteristics comparable to the starting material, thus

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eliminating the need for back-engineering a different starting formula for each set of process parameters.

What is also needed is a way to produce a final product in which the process parameters can be easily controlled, such that it becomes easy to produce a high quality final product.

In accordance with the present invention as claimed in claim 21, this is done simply by limiting the residency of the particles in the fluidized bed. By limiting residency time, high evaporation rates of flavorant/aroma is avoided and the final product has an unexpectedly superior trueness to the original flavor/fragrance.

Turning to Cherukuri et al, the second main reference cited by the Examiner, Applicants have reviewed this reference and have determined that it is not relevant to the present invention. Particles are simply produced by spray drying or, if in a fluidized bed, in a batch process.

Present claim 21 includes as the main "critical claim limitation" a residency time of the flavoring and/or perfume preparation in the fluidized bed of less than 20 minutes. The closest prior art does not teach this critical limitation. As disclosed in the specification, the final product has same flavor or perfume characteristic as starting formulation. Claim 21 accordingly recites that the final product has essentially the same proportions of flavor or fragrance ingredients as the sprayed-in starting composition.

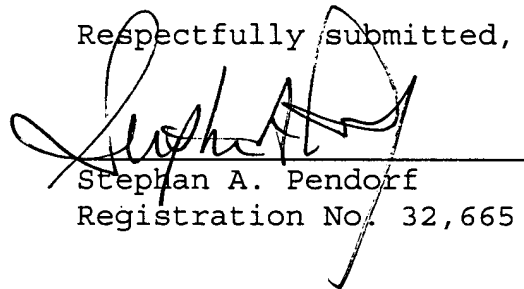
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Accordingly, the prior art not teaching the critical limitation of the present claims 1 or 21, withdrawal of the rejection is respectfully requested.

Favorable consideration and early issuance of the Notice of Allowance are respectfully requested. Should further issues remain prior to allowance, the Examiner is respectfully requested to contact the undersigned at the indicated telephone number.

Respectfully submitted,



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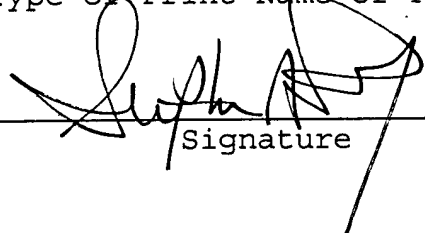
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CERTIFICATION OF FACSIMILE TRANSMISSION AND MAILING

I hereby certify that the foregoing AMENDMENT B for U.S. Application No.: 09/868,297 filed June 15, 2001, is being facsimile transmitted to the Commissioner for Patents, facsimile number (703) 872-9311, on this 12<sup>th</sup> day of May 2003.

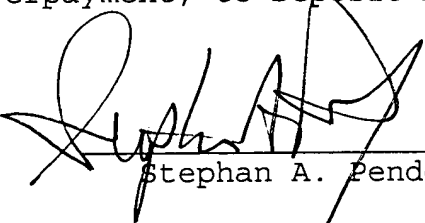
Stephan A. Pendorf  
Type or Print Name of Person Signing Certification

  
Signature

5-12-03  
Date

AUTHORIZATION TO CHARGE

The Commissioner is hereby authorized to charge any additional fees which may be required at any time during the prosecution of this application without specific authorization, or credit any overpayment, to Deposit Account No. 16-0877.

  
Stephan A. Pendorf



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**VERSION WITH MARKINGS TO SHOW CHANGES MADE HEREBY ATTACHED**

The Examiner is requested to accept the marked-up version as it is based on the previous version, which when modified as below, produces the clean version submitted with the current amendment.

**IN THE CLAIMS:**

Please add the following claim:

Please cancel claims 18-20.

Please add the following new claims:

--21. A continuous process for encapsulating a flavoring and/or perfume preparation, said process comprising:

- continuously spraying a spraying a spray solution comprising (a) water, (b) an emulsified flavoring and/or perfume preparation having ingredients having different evaporation rates, (c) optionally a solvent other than water and (d) a carrier into a stream of fluidizing gas,
- continuously evaporating solvent to form granules comprising encapsulated flavoring and/or perfume in a fluidized bed, and
- continuously classifying granules and separating granules from said fluidized bed as they reach a desired size,

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- wherein the average residency time of said flavoring and/or perfume preparation in said fluidized bed is 20 minutes or less, and
- wherein said flavoring and/or perfume ingredients having different evaporation rates are present in substantially the same proportions in the granules as in the spray solution.

22. A process as in claim 21, wherein said residency time is from 2 to 15 minutes.

23. A process as in claim 21, wherein said residency time is from 5 to 10 minutes.

24. A process as in claim 21, wherein said granules are formed by agglomeration.--